

### REMARKS

Entry of the foregoing amendments and favorable reconsideration of the subject application are respectfully requested in view of the following comments.

Claims 4-6 are currently pending in the subject application. Amendments to claims 4-6 have been made further defining the present invention over the prior art and claims 4-6, as herein amended, are herewith presented for the examiner's consideration.

Claims 4-6 have been amended to specify the ceramic product of the invention as non-annealed. This amendment is supported by the specification as filed, particularly the paragraph bridging from the bottom of page two to the top of page three wherein it is specifically noted that the surface toughened product is obtained without conventional annealing treatment.

Claims 4-6 have been further amended to clarify the "uniformly distributed linear dislocation structure" as "homogeneous" in accordance with the disclosure in the third paragraph of page 17 discussing the difference between the linear dislocation structure of the present invention as represented by Fig. 2 and that of ceramics produced using the

conventional technique with an annealing step as represented by Fig. 3.

Claim 4 has been further amended to specify that the uniformly distributed homogenous dislocation structure of the present invention extends within the subsurface regions to a depth of not more than 30 $\mu$ m, thereby positively limiting the depth extent of the dislocation structure to that specified in the last paragraph on page 15 of the specification as filed.

Applicants respectfully submit that no new matter has been added by the foregoing amendments.

In view of the foregoing amendments, Applicants respectfully submit that the claims now positively recite features of the present invention in a manner to distinguish over the prior art and place the claims in condition for allowance. Inasmuch as these amendments serve to further refine and/or distinguish the claims, do not add any matter requiring further search and/or examination by the examiner, are fully supported by the application as filed, and are believed to place the application in condition for allowance, Applicants respectfully submit that the amendments should be entered at this time.

**Rejection of Claims 4-6 Under 35 U.S.C. 102(a or e) or, in the  
Alternative, Under 35 U.S.C. 103(a)**

Claims 4-6 have been rejected under 35 U.S.C. 102(a or e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Saka, et al., (U.S. 6,884,386, or WO02/24605) for the reasons of record.

The Office Action states:

"The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Applicants argument that the instant inventions directed to a surface toughened that is formed from a process that does not include annealing while Saka et al '386 requires annealing is not persuasive in overcoming the rejection. Firstly, only claims 5 and 6 exclude annealing therefor this argument is not considered to be directed to claim 4. Secondly, the instant claims are considered to encompass the intermediate product formed by Saka et al '386 that is formed before the shot blasted product is annealed, such as the product formed in step (a), column 2, lines 35-37. Furthermore, differences in dislocation structure discussed at page 17 and page 18 of the instant disclosure the claims are silent as to any of the described limitations. Applicants have not shown by way of tangible evidence any differences in the dislocation structure and that the CLAIMS reflect these differences.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. differences in dislocation structure) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Guens*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Lastly process limitations are not considered to patentably distinguish a product.

In product-by-process claims, "once a product appearing to be substantially identical is found and a 35 U.S.C. 102/103 rejection [is] made, the burden shifts to the applicant to show an unobvious difference." MPEP 2113. This rejection under 35 U.S.C. 102/103 is proper because the "patentability of a product does not depend on its method of production." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Applicants respectfully traverse the rejection under 35 U.S.C. 102(e) on the ground that the Saka, et al., reference U.S. 6,884,386 or WO 02/24605 is excluded as a reference under 35 U.S.C. 102(e) because the International Application Publication by WIPO was not in English.

For a reference to qualify as prior art under 35 U.S.C. 102(e) it must be:

"... (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or  
(2) a patent granted on an application for patent by another filed in the United states before the

invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language;..." (Emphasis supplied.)

The statute and the MPEP are clear on the applicability of potential references under 35 U.S.C. 102(e). Where such references are based on an International Application filed under the PCT, they must meet three criteria to qualify under either clause 1 or clause 2.

- (1) The International Application must have been filed on or before November 29, 2000, and
- (2) The International Application must have designated the United States, and
- (3) The international publication under PCT Article 21(2) must have been in English.

If any one of these criteria is missing, the reference does not qualify under 35 U.S.C. 102(e).

Referring to MPEP §706.02(f)(1) and the examples provided therein, Applicants respectfully direct the examiner's attention to "Example 5: References based on the national stage (35 U.S.C. 371) of an International Application filed on or after November

29, 2000 and which was not published in English under PCT Article 21(2)" and note that the publication of WO 02/24605 was in the Japanese language, not English. Accordingly, neither WO 02/24605 nor U.S. 6,884,386 qualify as a reference under 35 U.S.C. 102(e) and Applicants respectfully submit that the rejection of claims 4-6 under 35 U.S.C. 102(e) is without support and should be withdrawn.

With regard to the rejection under 35 U.S.C. 102(a) over Saka, et al., U.S. 6,884,386 or WO 02/24605, Applicants respectfully point out that:

"For 35 U.S.C. 102(a) to apply, the reference must have a publication date earlier in time than the effective filing date of the application, and must not be Applicant's own work." (MPEP §706.02(a)(II)(C))

With regard to U.S. 6,884,386, Applicants respectfully traverse this ground of rejection by perfecting their priority claim to their earlier filed Japanese application 2002-300765 with the herewith submitted English language translation of JP2002-300765, which was filed October 15, 2002. In accordance with PCT Rule 17.1(a) or (b), the priority document was transmitted to and received by the International Bureau in the corresponding International Application PCT/JP03/13178, of which the present application is the U.S. national phase, and receipt

of that priority document with Applicants' claim thereto has been acknowledged by the USPTO by inclusion on Form PCT/DO/EO/903 (371 Acceptance Notice).

Inasmuch as Applicants' priority date of October 15, 2002 precedes the August 28, 2003 U.S. publication date of U.S. Patent 6,884,386, Applicants respectfully submit that the rejection of claims 4-6 under 35 U.S.C. 102(a) over U.S. Patent 6,884,386 has been overcome and should be withdrawn.

Furthermore, with regard to the rejection under 35 U.S.C. 102(a) over Saka, et al., WO 02/24605, and, by extension, U.S. 6,884,386, Applicants respectfully point out that the non-claimed subject matter therein relied upon by the examiner is the work of the common inventor, Hiroyasu Saka, and submit herewith the declaration of Dr. Saka under 37 CFR 1.132 establishing the inventive concept of the non-annealed ceramic product of the present invention and the non-claimed disclosure thereof in WO 02/24605 and U.S. 6,884,386 as derived by him from his work in the art of ceramics. The invention of claims 4-6 is the result of further study and experimentation by Dr. Saka evolving from his work in WO 02/24605 and U.S. 6,884,386 as described in the present application.

Accordingly, inasmuch as the invention recited in the present claims and the non-claimed disclosure in WO 02/24605 and U.S. 6,884,386 is the work of the inventor, Hiroyasu Saka, and the fact that the effective date of the present application precedes the U.S. publication date of 6,884,386, Applicants respectfully submit that neither reference qualifies under 35 U.S.C. 102(a) and that the rejection of claims 4-6 under 35 U.S.C. 102(a) as anticipated by the Saka, et al. references WO 02/24605 and U.S. 6,884,386 has been overcome and should be withdrawn.

In view of the foregoing, Applicants respectfully submit that the Saka, et al., references WO 02/24605 and U.S. 6,884,386, have been disqualified as valid references under 35 U.S. 102(a) or (e) and that the rejection of the pending claims under those sections have been overcome.

With regard to the alternative rejection under 35 U.S.C. 103(a), Applicants respectfully traverse the rejection on the ground that, not only is the disclosure relied on by the examiner the work of the common inventor, Hiroyasu Saka, but the reference teaches away from the present invention.

As previously noted, the Federal Circuit has held that a *prima facie* case of obviousness must establish: (1) some



suggestion or motivation to modify the references; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991; In re Fine, 5 USPQ2d 1596, 1596 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

A *prima facie* case of obviousness must also include a showing of the reasons why it would be obvious to modify the references to produce the present invention. Ex parte Clapp, 277 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). The examiner bears the initial burden of providing some convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings. Id. at 974.

The present application claims a non-annealed ceramic product having a uniformly distributed homogenous linear dislocation structure in the sub-surface regions within a depth of not more than 30 $\mu$ m from the surface and a dislocation density of from  $1 \times 10^8$  to  $9 \times 10^{13}$  cm<sup>-2</sup>. This structure is obtained by plastic working of the ceramic structure without annealing where the plastic working is carried out by shot blasting the ceramic with the abrasive particles at a pressure of 0.1 to .05MPa, a

shot blasting speed of 20m/sec to 250m/sec and a shot blasting time of 0.1sec/cm<sup>2</sup> to 60sec/cm<sup>2</sup>.

As pointed out in connection with the rejection under 35 U.S.C. 102(a or e), the non-claimed subject matter of the reference is the work of the common inventor, Hiroyasu Saka, and the present invention is the result of further study and experimentation evolving from that previous work as clearly noted at pages 1-3 of the specification as filed. Since the prior art and the accepted methods of surface toughening ceramic products routinely include the use of heat in an annealing process, whether with or without plastic working, there is nothing in the cited reference to suggest that useful, hardened ceramic structures can be obtained by plastic working alone without applying a heat treatment step to anneal the product. Only through the continued investigation and experimentation described in the present invention did the Applicants herein discover that a ceramic product exhibiting uniformly distributed linear dislocations providing surface toughening without generating micro-cracking could be produced without a conventional annealing treatment.

Inasmuch as the present invention is the result of the common inventor Hiroyasu Sato's own work which continued during

the application phase of the reference, Applicants respectfully submit that the present invention was clearly not obvious to the present inventors, let alone one of ordinary skill in the art in view of the additional work that was required to develop the invention.

Furthermore, as previously pointed out, the reference teaches a ceramic product having a non-homogenously distributed, non-linear dislocation structure obtained by shot blasting followed by heat treatment at a temperature of from 1,000°C to 1,600°C. Applicants respectfully point out that nothing in the cited reference teaches or suggests the production of a toughened ceramic product by plastic deformation or heat treatment alone. The teaching of the reference is specific to a toughened ceramic product produced by a combination of plastic deformation and heat treatment in that order. As shown and described in the present application, the combined plastic deformation and heat treatment of the reference results in a ceramic structure having a different internal structure than that of the present invention.

In this regard, the examiner is again referred to the comparison of the structure of the present invention with that of the reference as is clearly described in the specification at

page 17, line 17 to page 18, line 2 (paragraph 42 in Pub. No. 2006/0293165).

"In Fig.2, especially from enlarged drawing (B), in the sub-surface regions of specimen treated by the present invention, linear dislocation structure that distributed homogeneously caused by the fact that the plastic deformation caused homogeneously can be observed. In the drawing, black linear line is dislocation, and at the surface of the product, block of black part which is formed by accumulating dislocation can be observed. In Fig.2, whity part can be observed at the surface of product, however, this is caused by not meeting of observation condition because the crystal of whity part is slightly rotated against the crystal of black part, and by adjusting the observation condition said part becomes black and the existing of dislocation can be confirmed. In the meanwhile, according to Fig.3 of the transmission electron microscope picture of ceramics product to be treated using conventional technique, dislocation structure becomes a net work shape dislocated cell structure, which is a stabilized arrangement, by annealing treatment after plastic working. In this Figure, dislocation is accumulated at the black net work part and consequently dislocation density becomes high, and in whity part is the range where dislocation does not exist. Since dislocation does not exist at this whity part, it does not change color to black, even if the observation condition is changed. Thus, the structure obtained by the method for surface toughening of the present invention is remarkably different from the structure obtained by conventional technique."

As the reference discloses, particularly in column 2 and at column 4, lines 58-64, the heat treatment (annealing) in the reference is conducted so as to recrystallize the ceramic near fine cracks generated following the plastic working and this

heat treatment is conducted at temperatures in the range of 1,000°C to 1,600°C. This heat treatment and subsequent recrystallization results in a network dislocation structure as shown in Fig. 3 of the present invention which is clearly and structurally different from the uniformly distributed homogeneous linear dislocation structure of the present invention of the present invention as illustrated in Fig. 2.

The herewith filed Declaration of Dr. Saka further illustrates the difference in the dislocation structure of the product of the present invention as opposed to that of the prior art product disclosed in WO 02/24605. Looking at the transmission electron microscope images attached to the Declaration, Applicants point out that the dislocation structure of the present invention, as shown by the left side images, is very clearly a linear arrangement that is uniformly distributed through the upper portion of the product. In contrast, the dislocation structure of the product of the prior art, as shown by the right side image, is a non-linear, non-uniform, network dislocation which results from recrystallization of the ceramic when exposed to annealing temperatures.

As noted in the reference, the heat treatment, or annealing, of the product recrystallizes the ceramic near fine

cracks which forms dislocated cells at a grain boundary and finely divides the dislocation structure. This cellular dislocation structure is very clearly shown in the right side image in Dr. Saka's Declaration and, as noted, is significantly different from the uniformly distributed and homogeneous linear dislocation structure of the present invention as shown in the left side images. Nothing in the reference suggests the elimination of the annealing step or that a non-annealed product of plastic worked ceramic would exhibit a dislocation structure as claimed with the expectation that such a non-annealed structure would have the desired surface toughness.

Accordingly, absent some suggestion in the reference to eliminate the annealing step and that elimination of that step would yield the uniformly distributed linear dislocation structure of the present invention, Applicants respectfully submit that there is no motivation which would urge one of ordinary skill in the art to depart from that teaching and to modify the reference with any reasonable expectation of success.

In the absence of any such suggestion, Applicants respectfully submit that a *prima facie* case of obviousness of the present invention over the reference to Saka, et al., has

not been made and that the rejection of claims 4-6, as amended herein, is without support and should be withdrawn.

The examiner argues that the lack of annealing is not persuasive because only claims 5 and 6 exclude annealing. By the foregoing amendment to claims 4-6, Applicants have now specified that the product recited in the claims is a "non-annealed ceramic" thereby excluding annealing in claim 4 as well as claims 5 and 6.

The examiner further alleges that the instant claims are considered to encompass the intermediate product formed by the reference before annealing. Applicants respectfully submit that nothing in the reference suggests that one stop with such an intermediate product. Indeed, the reference specifically requires that the intermediate product be heat treated to recrystallize the fine cracks as represented by the examples therein. No examples represent a ceramic product obtained solely by plastic deformation without a following heat treatment. Accordingly, Applicants respectfully submit that a surface hardened non-annealed ceramic product having a uniformly distributed homogenous linear dislocation structure as recited in the present claims was not, at any time, considered by the

reference. To suggest otherwise would be to ignore the complete teaching of the reference.

With regard to the examiner's allegation that the claims are silent as to the limitations of the dislocation structure described in the specification, Applicants note that the foregoing claims have also been amended to positively recite the dislocation structure as "homogeneous" in accordance with the disclosure at page 17-18 and Fig. 2. Accordingly, Applicants respectfully submit that the claimed product is positively defined by that structure which is different from and neither anticipated by nor obvious from the disclosure of the reference. As noted herein and in the specification, the annealing step disclosed in the prior art results in a recrystallization of the ceramic and the production of the network dislocation exhibited in Fig. 3, not the uniformly distributed homogeneous linear dislocation of the present invention as shown in Fig. 2.

In view of the foregoing, Applicants respectfully submit that the product of the present invention is structurally distinguished over the product of the reference and that the rejection of claims 4-6 as obvious over Saka, et al., has been overcome.



**Rejection of Claims 4-7 under 35 U.S.C. 102(b) or, in the**

**Alternative Under 35 U.S.C. 103(a)**

Claims 4-7 have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese document 07-157362. The Office Action states:

"The Japanese document fails to teach the limitation of uniformly distributed dislocation at a depth of 30 microns. This limitation is interpreted as the dislocations are uniformly distributed at a depth of 30 microns. Although this limitation is not disclosed by the Japanese reference the degree of uniformity is not set forth in the claims as a quantitative value that can be compared to the Japanese document. Furthermore, applicants have not shown by way of tangible evidence any differences in the claimed product and that taught by the Japanese document that the CALIMS [sic] include limitations that reflect these differences. Without quantitatively defining what is encompassed by uniformly distributed one of ordinary skill in the art cannot distinguish what is considered to be encompassed by uniformly distributed limitation of the claim. How uniform must the dislocations be to be considered within the scope of the claims? It should also be noted that the claims do not limit the dislocations to only be present in a depth of 30 microns, only that the dislocations are uniformly distributed.

It is also agreed that the Japanese document teaches a different method of forming a product having dislocations however the process of manufacture is not considered to patentably distinguish the claimed product. The description of the particles used in shot blasting, such as set forth in claims 5 and 6, are not considered to distinguish the claimed product that is subjected to shot blasting. Applicants are

not claiming a method of shot blasting, but the article formed by the method. The claimed PRODUCT must be patentably distinguished not the method of forming the claimed product. It is further emphasized that the Japanese document teaches a quantitatively defined dislocation density within the range set forth in the instant claims. Applicants have not supplied any tangible evidence in respect to a difference in dislocation structure and that the claims reflect these differences."

Applicants note that, at the beginning of this rejection, the examiner specifically states "Applicants' amendment to the claims overcame the rejection of claim 4 as being clearly anticipated under 102(b)". If that is the case, Applicants respectfully submit that this rejection should be limited to an obviousness rejection under 103(a), not an alternative rejection under 102(b), which has been admitted as being overcome, or 103(a). In addition, since the examiner has admitted that the rejection of claim 4 as anticipated has been overcome, there should be no rejection of claims 5 and 6 under 102(b) since those claims are dependent from claim 4.

Applicants therefore respectfully submit that, by the examiner's own admission, the rejection of claims 4-6 as anticipated by Japanese document 07-157362 under 35 U.S.C. 102(b) has been overcome and should be withdrawn.

Applicants further respectfully traverse the rejection on the ground that the reference does not teach each and every claimed limitation of the amended claims.

As applicants have previously noted, the claims have been amended to specify the product of the present invention as a "non-annealed ceramic product" which has a "uniformly distributed homogenous dislocation structure within a depth direction of not more than 30 $\mu$ m from the most exterior surface of the ceramic product."

The Japanese document discloses a product that is formed by "hot pressing processing" which involves heating a ceramic item to a temperature of 1300-1400°C under pressure. In such a process, the pressure is uniformly applied over the entire ceramic item, not as a plurality of minute impacts as occurs with shot blasting. As such, this is a direct heat treatment process which results in a different structure being imparted to the final ceramic product, with that structure being formed throughout the entire product, and not confined to the sub-surface regions within a depth of not more than 30 microns.

Furthermore, as discussed above in connection with the Saka, et al., reference, the combination of plastic deformation and heat treatment results in a recrystallization of the ceramic

structure producing a network dislocation structure that is clearly different from the uniformly distributed homogeneous linear dislocation structure of the present invention. The fact that, in the Japanese document, the plastic deformation as the result of pressing and the heat treatment are applied simultaneously does not change the result that a different dislocation structure results than when the heat treatment is eliminated.

In view of the foregoing, Applicants respectfully submit that the claimed product presents a different structure from that of the reference, that structure being clearly recited as a "uniformly distributed homogeneous linear dislocation structure" that is specifically limited to the region of the ceramic product not exceeding 30 microns in depth. As shown by a comparison of Figs. 2 and 3 of the present application, the physical nature of such a uniformly distributed homogeneous linear dislocation structure is clearly different from the network structure which results when plastic deformation is combined with heat treatment and that this difference is readily understood by those of ordinary skill in the art. In no way would one expect to obtain the structure of the ceramic product

of the present invention using the hot pressing process of the Japanese document.

Accordingly, Applicants respectfully submit that the Japanese document fails to teach or suggest the dislocation structure of the ceramic product of the present invention as claimed and that, since such a structure would not be obtained using a hot pressing process, a quantitative value applied to the uniform distribution is not necessary. However, Applicants respectfully submit that the terms "uniform" and "homogeneous" are understood by those of ordinary skill in the art relating to ceramic structures such that quantitative values are not necessary.

Furthermore, Applicants respectfully disagree with the examiner's representation that "the claims do not limit the dislocation to be only present in a depth of 30 microns." Applicants respectfully submit that the examiner has misread the limitation as apparently reciting that the dislocation structure is only found at the level of 30 microns when the claim clearly states that the dislocation structure in the sub-surface regions within a depth direction of 30 microns from the most exterior surface. The use of the language "in the sub-surface regions within a depth direction of 30 $\mu$ m from the most exterior surface"

clearly identifies the space from the surface of the ceramic product to a depth of 30 microns. In order to more clearly recite this limitation, claim 4 has been amended to specify the depth as "not more than 30 $\mu$ m". Accordingly, Applicants respectfully submit that the claims clearly limit the location of the dislocation structure and that the reference fails to teach or suggest such a limitation in a ceramic product that is subjected to hot pressing as is disclosed in the reference. As noted above, since hot pressing is applied around the entire three dimensional surface of a ceramic product, the resulting dislocation structure is expected to be formed throughout the entire product, not confined to the sub-surface regions within a depth of not more than 30 microns.

The examiner has noted that Japanese document 07-157362 discloses a dislocation density within the range set forth in the claims and appears to equate this to the claimed dislocation structure. Applicants respectfully point out that the dislocation density and the dislocation structure are neither the same, nor equivalent. The dislocation density is a measure of how many dislocations are present in a quantity of a material, i.e., number of dislocations per unit volume. In contrast, the dislocation structure is the actual structure of

the dislocations within the material. Applicants respectfully submit that the dislocation density is not an indicator of the dislocation structure and that different dislocation structures may have the same or similar dislocation density, even where the dislocation structure of one product is in a limited area and the dislocation structure of the other product exists throughout the product.

Applicants respectfully point out that, although the reference discloses a dislocation density of  $1 \times 10^4$  to  $9 \times 10^{14} \text{cm}^{-2}$ , it fails to teach or suggest a dislocation structure corresponding to that claimed in the present invention, i.e., "a uniformly distributed homogenous linear dislocation structure in the sub-surface regions within depth direction of not more than  $30 \mu\text{m}$  from the most exterior surface". Accordingly, Applicants respectfully submit that the reference fails to disclose each and every element of the invention recited in claim 4 or suggest that the resulting product exhibits the claimed dislocation structure.

Furthermore, Applicants respectfully submit that the claimed dislocation structure cannot be said to be inherent in the reference because the reference teaches a process which involves the application of high heat, i.e.,  $1300^\circ\text{C}$  to  $1400^\circ\text{C}$ ,

to the ceramic product. Indeed, the process of the reference is described as hot-pressing in which the plastic deformation is conducted simultaneously with heating or annealing. Hot pressing is a different process than shot blasting in that with hot pressing force is applied simultaneously and consistently over the entire surface of an article, whereas with shot blasting, the pressing force is applied at individual minute locations over the surface of the article by the high speed application of a plurality of abrasive particles. In that regard, the recited limitations of claims 5 and 6, as amended herein, are completely absent from the present reference as there is no disclosure or suggestion of the employment of a shot blasting process where the particles have a convexly curved surface and an average particle size of 0.1 $\mu$ m to 250 $\mu$ m with a Vickers hardness of 500 or more. Nor is there any disclosure or suggestion that such particles are directed to the ceramic product at a pressure of 0.1 to 0.5MPa at a speed of 20m/sec to 250m/sec for a time of 0.1sec/cm<sup>2</sup> to 60sec/cm<sup>2</sup>.

Since the processes applied to the ceramic article result in the structure and properties displayed by the final article, Applicants respectfully submit that the processes and particles used can serve to define the article that is formed.



Accordingly, Applicants respectfully submit that the recitations of the particles and the process used in dependent claims 5 and 6, taken in conjunction with the structural recitations of independent claim 4 can distinguish the claimed product over that of the prior art, particularly where the product of the prior art is produced using a process which includes a step or conditions that are expressly excluded from the present invention and which have been shown to result in a significantly different structure.

In view of the foregoing, Applicants respectfully submit that the rejection of claims 4-6, as amended herein, as anticipated by Japanese document 07-157362 under 35 U.S.C. 102(b) or, in the alternative, as obvious over Japanese document 07-157362, has been overcome and should be withdrawn.

#### **Double Patenting**

Claims 4-7 have been provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 5, 6 of copending Application No. 10/599,604. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the copending claims overlap.

Claims 4-7 have been provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claim 5 of copending Application No. 10/553,849. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the copending claims overlap.

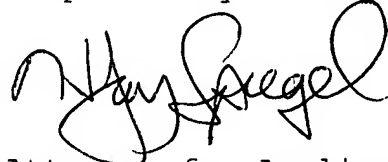
Applicants hereby submit a terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d), thereby overcoming these grounds of rejection

### **Conclusion**

In view of the foregoing, Applicants respectfully submit that the examiner's rejections have been overcome and that the claims as presented herein are allowable over the prior art.

An early notification of allowance is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "H. Jay Spiegel", is written over the typed name.

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